



Three Phase UPS, Symmetra PX160, 160 kVA

The Schneider Electric equipment referenced in this Certificate of Compliance has been certified to the requirements of the listed regional building codes and/or seismic design standards identified below. This certification is based on tri-axial shake-table test results conducted in accordance with globally recognized equipment test protocols. Assessment of earthquake demands (EDS-equipment demand spectrum) and equipment seismic capacity (ECS-equipment capacity spectrum) follows the guidelines contained in ISO 3010 and ISO 13033 respectively. Earthquake demand at location of equipment installation must be less than equipment capacity shown in ECS table to validate seismic conformance.¹

Product Category: UPS and Inverter System

Product Model: Three Phase UPS

Product Mounting: Rigid Floor Mount

Product Type: Symmetra PX160, 160 kVA

Listing of Regional Codes/Standards

Assumed Maximum Demands (EDS)² for Regional Codes/Standards

Tested Product Capacity (ECS)³ for Regional Codes/Standards

Country / Region	Code Identification	Exceedance Probability	EDS			EDS			ECS			ECS		
			Hazard Level Ground	EDS Horz A _{FLX-H} Ground	EDS Horz A _{RIG-H} Ground	Hazard Level Roof	EDS Horz A _{FLX-H} Roof	EDS Horz A _{RIG-H} Roof	Hazard Level Ground	ECS Horz A _{FLX-H} Ground	ECS Horz A _{RIG-H} Ground	Hazard Level Roof	ECS Horz A _{FLX-H} Roof	ECS Horz A _{RIG-H} Roof
Argentina	INPRES-CIRSOC103	10% in 50 yrs	Zone 4	1.05	0.35	Zone 4	1.89	1.05	Zone 4	1.51	0.50	Zone 4	2.19	1.21
Australia	AS 1170.4-2007	10% in 50 yrs	Z = 0.22	0.81	0.29	Z = 0.22	1.46	0.86	Z = 0.22	1.51	0.53	Z = 0.22	2.19	1.29
Canada*	2020 NBCC	2% in 50 yrs	S _a = 1.51	1.51	0.61	S _a = 1.38	2.22	1.68	S _a = 1.51	1.51	0.61	S _a = 1.38	2.22	1.68
Chile	NCh 433.Of1996	10% in 50 yrs	Zone 2	1.21	0.39	Zone 2	2.17	1.17	Zone 2	1.51	0.49	Zone 2	2.19	1.18
China	GB 50011-2010 (2016)	2% in 50 yrs	α _{Max} = 1.4	1.40	0.63	α _{Max} = 1.2	2.16	1.62	α _{Max} = 1.4	1.51	0.68	α _{Max} = 1.2	2.19	1.64
Colombia	NSR-10 Título A	10% in 50 yrs	A _a = 0.5	1.25	0.50	A _a = 0.45	2.13	1.42	A _a = 0.5	1.51	0.60	A _a = 0.45	2.19	1.46
Europe	Eurocode 8 EN1998-1	10% in 50 yrs	a _{Gr} = 0.32	1.44	0.58	a _{Gr} = 0.26	2.11	1.40	a _{Gr} = 0.32	1.51	0.60	a _{Gr} = 0.26	2.19	1.46
India	IS 1893 (Part 1) : 2016	10% in 50 yrs	Z = 0.36	0.90	0.36	Z = 0.36	1.62	1.08	Z = 0.36	1.51	0.60	Z = 0.36	2.19	1.46
Indonesia	SNI 1726:2019	2% in 50 yrs	S _s = 1.75	1.40	0.56	S _s = 1.5	2.16	1.44	S _s = 1.75	1.51	0.60	S _s = 1.5	2.19	1.46
Japan	Building Standard Law	10% in 50 yrs	Zone A	1.22	0.49	Zone B	1.98	1.32	Zone A	1.51	0.60	Zone B	2.19	1.46
Mexico	CFE MDOC-15	10% in 50 yrs	a ₀ ^r = 149	1.43	0.49	a ₀ ^r = 99	1.92	1.10	a ₀ ^r = 149	1.51	0.52	a ₀ ^r = 99	2.19	1.26
New Zealand	NZS 1170.5:2004+A1	10% in 50 yrs	Z = 0.46	1.38	0.61	Z = 0.4	2.16	1.60	Z = 0.46	1.51	0.67	Z = 0.4	2.19	1.62
Peru	N.T.E. - E.030	10% in 50 yrs	Zone 4	1.24	0.50	Zone 3	1.89	1.26	Zone 4	1.51	0.60	Zone 3	2.19	1.46
Russia	СП 14.13330.2018	10% in 50 yrs	MSK 9	1.02	0.41	MSK 9	1.84	1.22	MSK 9	1.51	0.60	MSK 9	2.19	1.46
Taiwan	CPA 2011 Seismic Design Code	10% in 50 yrs	S _s ^D = 0.8	1.20	0.48	S _s ^D = 0.8	2.16	1.44	S _s ^D = 0.8	1.51	0.60	S _s ^D = 0.8	2.19	1.46
Turkey	TBEC-2018	10% in 50 yrs	S _s = 1.25	1.50	0.60	S _s = 1.0	2.16	1.44	S _s = 1.25	1.51	0.60	S _s = 1.0	2.19	1.46
United States*	2018 IBC / ASCE 7-16	2% in 50 yrs	S _{DS} = 1.51	1.51	0.60	S _{DS} = 1.38	2.22	1.66	S _{DS} = 1.51	1.51	0.60	S _{DS} = 1.38	2.22	1.66

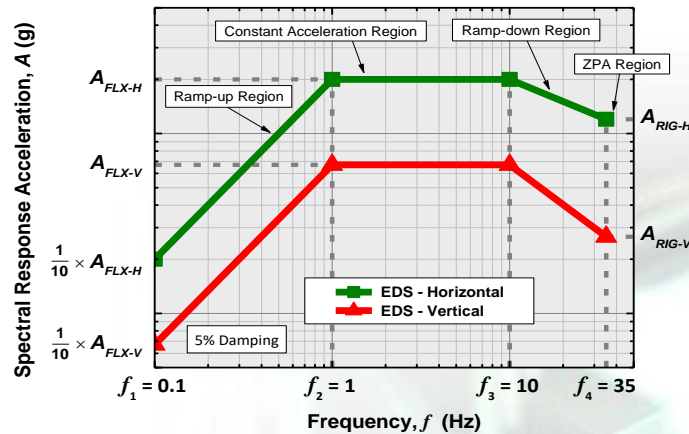
*EDS and ECS are defined at frequency points $f_1 = 0.1$ Hz, $f_2 = 1.3$ Hz, $f_3 = 8.3$ Hz, $f_4 = 33.3$ Hz with $BA_{FLX} |_{MAX} = 1.6$ in accordance with AC156 test protocol

Equipment Importance Factor⁴: $I_e > 1.0$ for applications in essential buildings and critical infrastructure where post-earthquake equipment functionality is required.

Installation Restrictions⁵: Equipment ECS must exceed EDS at install location and be anchored per manufacturer's Instruction Bulletin to validate certification.



Three Phase UPS, Symmetra PX160, 160 kVA Regional Codes and Standards EDS and ECS Shape Profiles



$$A_{FLX-H} = BDS_{PEAK G} (BA_{FLX})$$

$$A_{FLX-V} = \frac{2}{3} (BDS_{PEAK G})$$

$$BA_{FLX} = \left(1 + 2 \frac{z}{h}\right) \rightarrow \begin{matrix} BA_{FLX}|_{MAX} = 1.8 \text{ or} \\ BA_{FLX}|_{MAX} = 1.6 \end{matrix}$$

$$A_{RIG-V} = \frac{2}{3} (PGA_{MAX})$$

$$A_{RIG-H} = PGA_{MAX} (BA_{RIG})$$

$$BA_{RIG} = \left(1 + 2 \frac{z}{h}\right) \rightarrow BA_{RIG}|_{MAX} = 3.0$$

Horizontal Shape Profile Rules

A_{FLX-H} = Peak response acceleration ($BDS_{PEAK G}$), taken from a given country/region building design spectrum for all code prescribed soil type classifications using assumed maximum hazard level, multiplied by a building amplification factor (BA_{FLX}) to account for amplified response of equipment installations located above grade elevation. The BA_{FLX} factor is a function of the z/h height ratio where z is the height in structure at equipment location and h is average roof height of structure relative to grade elevation. The z/h height ratio ranges from zero at ground to one at roof elevation. The BA_{FLX} factor is limited to a maximum value of either 1.6x or 1.8x depending on the code. The BA_{FLX} limit factor accounts for building structure inelastic response reductions during strong ground shaking events over the amplified portion of the EDS from f_2 to f_3 frequency points. Building design spectrum parameters not related to ground motion intensity are set to unity.

A_{RIG-H} = Maximum response acceleration at zero period ($T = 0$), taken from a given country/region building design spectrum for all code prescribed soil type classifications using assumed maximum hazard level. This acceleration is the peak ground acceleration (PGA_{MAX}). The PGA_{MAX} is multiplied by a building amplification factor (BA_{RIG}) to account for amplified response of equipment installations located above grade elevation. The BA_{RIG} factor is a function of the z/h height ratio and corresponds with an amplified PGA_{MAX} during strong ground shaking events at the ZPA (zero period acceleration) portion of the EDS at f_4 frequency point. Building design spectrum parameters not related to ground motion intensity are set to unity.

Vertical Shape Profile Rules

A_{FLX-V} = A two-thirds ratio of the peak response acceleration ($BDS_{PEAK G}$), taken from a given country/region building design spectrum for all code prescribed soil type classifications using assumed maximum hazard level. The two-thirds ratio of $BDS_{PEAK G}$ is constant for all equipment locations and is not a function of the z/h height ratio and corresponds with the amplified portion of EDS from f_2 to f_3 frequency points. Building design spectrum parameters not related to ground motion intensity are set to unity.

A_{RIG-V} = A two-thirds ratio of the maximum response acceleration at zero period ($T = 0$), taken from a given country/region building design spectrum for all soil type classifications using assumed maximum hazard level. The two-thirds ratio of PGA_{MAX} is constant for all equipment locations and is not a function of the z/h height ratio and corresponds with the ZPA (zero period acceleration) portion of the EDS at f_4 frequency point. Building design spectrum parameters not related to ground motion intensity are set to unity.



Three Phase UPS, Symmetra PX160, 160 kVA Regional Codes and Standards Compliance Notes

1. Equipment location is defined as the final geographic location of equipment installation. Earthquake demands are prescribed based on install location using code specified hazard maps and site geotechnical classification. The EDS table (equipment demand spectra) presents assumed maximum hazard demands for the given regional code or standard and may not be absolute code maximums. Assumed maximum demands represent a practical limit for building construction. It is the responsibility of the building design professional or engineer of record (EOR) to ensure the earthquake demand at equipment install location, as prescribed by code hazard maps and site classification, is less than the equipment tested seismic capacity as shown in ECS table.
2. The referenced regional building codes and standards specify seismic demand requirements in terms of ground-level site hazard response spectra used for seismic design. Site hazard spectra are generally defined in terms of three constructs: (1) location dependent ground spectral acceleration shape profile which varies with geographic location and is determined by response spectrum shape factors or formulas, which are adjusted for geotechnical site soil classification, (2) site class correction parameters that are dependent on the soil/rock classification at building construction site with the maximum values assumed herein, and (3) factors related to earthquake return rate or to convert maximum considered to design level earthquake assuming the identified probability of exceedance. Factors not related to seismic ground motion intensity are set to unity. Equipment demand spectra (EDS) are defined as the peak responses from the site hazard spectra multiplied by a building amplification factor, $(1 + 2z/h)$, to account for dynamic amplification effects for equipment installations above grade elevation (see pg. 2). The identified EDS peak response magnitudes at ground and roof height elevations are assumed maximum demands for the listed region. Assumed maximum demands represent a practical limit for building construction. The equipment install location for this certification may be at a location that exceeds the assumed maximum hazard levels.
3. Equipment capacity is established with tri-axial seismic shake-table test results in accordance with the International Code Council (ICC) Acceptance Criteria for Seismic Certification by Shake-Table Testing of Nonstructural Components (AC156, dated December 2020). The equipment demand spectra (EDS) shape profiles are defined as broadband spectra with energy content from f_1 to f_4 Hz, adjusted for building amplification effects, and is the test input for nonstructural equipment qualification. To satisfy the EDS, the corresponding shake-table drive signals are nonstationary, multi-frequency random excitations. Equipment capacity spectra (ECS) are derived from shake-table test data results for horizontal and vertical input motions. It is the responsibility of the EOR to validate the tested equipment capacity exceeds the seismic demand at equipment install location.
4. An equipment importance factor, I_e , that is greater than one ($I_e > 1.0$) is assumed and indicates that equipment functionality is required after a seismic event and after seismic simulation testing. This importance factor is applicable for designated seismic systems (i.e., essential equipment applications) within critical facilities where post-earthquake equipment functionality is a requirement.
5. Seismic certification of nonstructural components and equipment by Schneider Electric is just one link in the total chain of responsibility required to maximize the probability that the equipment will be intact and functional after a seismic event. During a seismic event the equipment must be able to transfer the inertial loads that are created and reacted through the equipment's force resisting system and anchorage to the load-bearing path of the building structural system. Anchorage of equipment (i.e., nonstructural supports and attachments) to the primary building structure is required to validate this seismic certification. The structural engineer or design engineer of record (EOR) is responsible for detailing the equipment anchorage requirements for the given installation. The installer and manufacturers of the anchorage system are responsible for assuring the mounting requirements are met. Schneider Electric is not responsible for the specification and performance of anchorage systems.

FO, Catalog or SKU Numbers: Symmetra PX160, 160 kVA
Three Phase UPS

Issue Date: 7/18/2022

This is a generalized, multi-code certificate and not specific to a regional code's seismic demand requirement. If code and site-specific certificates are required, contact your local Schneider Electric representative with code details and equipment location to request code/site-specific certificates.

Additional details regarding this Certificate of Compliance can be found at:
https://www.se.com/ww/en/download/document/Buildings_512_en/



Authorization Signature

Name: Landon Boyer

Position: VP Engineering Power Products

Signature:

Certificate Number: O-10034235